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ABSTRACT

A study was conducted to determine whether students who mapped prior and post knowledge of a basal reading lesson would achieve higher scores on a comprehension test and write better summaries of those stories than would students who received traditional basal reading instruction. Subjects, 30 fifth grade students, participated in either a treatment or a control group condition. Subjects in both groups read the same six stories. The treatment group teacher identified key concepts from each story and mapped the students' prior knowledge before each reading. Then the students read to confirm the accuracy of their knowledge, clarify misinformation on their maps, and add new information. Next, they wrote story summaries and completed a comprehension test. Instruction for the control group students concentrated on vocabulary words, silent reading, oral discussion, and summary writing. Results showed that test scores of the treatment group students were markedly higher than those of the control condition students. No difference was found in the overall quality of the writing of the two groups. (FL)

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The Effects of a Composing Model on Fifth Grade Students' Reading*

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The Effects of a Composing Model on Fifth-Grade Students' Reading Comprehension

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Abstract

Recent inquiry into the development of reading and writing skills suggests the importance of stressing the interrelationship of these skills within a total process of constructing meaning rather than a focus on discrete skills. Historically, the skills involved in writing and reading have been viewed as distinct and separate. For instance, terms such as "encoding" and "decoding" emphasized differences in the two processes. Current thinking in the field, however, links these two skills much more directly (Wittrock, 1984; Tierney and Pearson, 1983). In this study, the authors developed an instructional model for a basal reading lesson which included identification of key concepts, mapping of these concepts and related shared knowledge of students, silent reading, and written summary statements. The model was designed to incorporate a visual representation of students' pre-and post-knowledge of key concepts and to employ both reading ad writing skills. Comparison of treatment and control group performance on six reading tests show significant differences in favor of the treatment group. Examination of students' written summary statements, scored holistically showed no differences between treatment and control groups at the end of the study.

The Effects of a Composing Model on Fifth Grade Students' Reading Comprehension

Prior knowledge is critical to understanding. Reading researchers and learning theorists agree that background of experience and world knowledge influence comprehension of reading materials. According to Baker and Brown (1984), the ability to grasp the logical organization of a text is firmly rooted in one's prior knowledge of the world; and Rumelhart (1976) points out, reading comprehension is an interactive process in which both text and world knowledge play key roles. Therefore, in order to comprehend and learn meaningfully, students must relate ideas to one another and to existing conceptual themes (Ausubel, et al., 1978). Succinctly stated, understanding occurs when children relate new knowledge to what they already know.

Mapping, a strategy mentioned by some theorists when suggesting techniques for improving comprehension (Pearson and Johnson, 1978), can be used to illustrate students' prior knowledge of key concepts before reading a story. And, if students map newly acquired knowledge and verify the accuracy of their prior knowledge after reading a story, both cognitive and visual associations are established between the new information and what is already known. While the literature encourages such a mapping strategy (Pearson and Spiro, 1982; Davidson, 1982), comparatively little research has been conducted on whether map usage before, during, or after reading significantly increases comprehension when compared with other strategies (Sinatra, et al., 1984).

In the present study, the researchers developed a composing model for a basal reading lesson which included the identification of key concepts and mapping of students' prior knowledge of these concepts. Next the students silently read and then verified the accuracy of their prior knowledge. Finally, students wrote summaries of each story. Since mapping is often identified as an organizational step leading toward some form of writing, it seemed important to conclude the lesson with a written task to determine the effect of the strategy upon both reading comprehension and writing performance.

Hypothesis

It was hypothesized that students that mapped prior and post knowledge of a basal reading lesson would achieve higher on tests of reading comprehension and write better summaries of stories than students who received the traditional basal reader lesson.

METHOD

Subjects

The Ss for the study were thirty fifth-grade students attending a middle-class school in suburban Houston, Texas. All students in fifth grade who were reading on-grade level, scored between the 40th and 80th percentile on the reading subtest of the SRA achievement battery, and were considered properly placed by the previous year's teacher, had been randomly assigned to "average" reading groups at the beginning of the year. Two intact average ability reading groups, taught by the same teacher in back-to-back classes, were used in the study. A flip of the coin was used to assign sections to treatment or control conditions. Initial *t*-tests used to compare the two groups on intelligence scores and reading grade equivalents

on the SRA reading composite showed no significant differences initially between the treatment and control groups.

Procedure

The study was begun the first week in October and continued for six weeks. The teacher was a master teacher with seven years of experience. She was trained in using the composing model and observed by the experimenters periodically to assure implementation of the model. She was also trained to use the basal reader approach with the control group. Since the two methods were quite distinct in nature, there was minimum contamination across the two groups.

The treatment group read six stories in a unit from Banners, a fifth grade text published by Houghton-Mifflin. The teacher identified two or three key concepts from each of the six stories. These concepts were not known to the researchers. The schedule for the treatment groups was as follows:

DAY 1 MAPPING PRIOR KNOWLEDGE OF KEY CONCEPTS. The teacher pointed out the title of the story and each of the key concepts selected. Then, working through one concept at a time, the students told the teacher what they knew about that concept. Acting as scribe, the teacher recorded what the students had to say on chart paper. (See sample map.) Then, the students read the story silently.

DAY 2 POST MAPPING. Referring back to the map, the students first confirmed the accuracy of prior knowledge. The students identified those statements on the map that had been confirmed by the story and an asterisk was placed by those ideas. Accurate information that was not confirmed

Model

VOLCANOES (key concept)

*1. VOLCANOES ARE LARGE AND ERUPT WITHOUT WARNING. THEY ARE HOLES IN THE GROUND.

*2. BURNING RED LAVA COMES FROM VOLCANOES

*3. VOLCANOES ARE MOUNTAINS AND OFTEN FORM ISLANDS

4. MT. ST. HELENS IS A LARGE VOLCANO, *SOME LOCATED IN HAWAII

5. VOLCANOES HAVE NAMES

6. Volcanoes' lava flowing into the ocean kills fish

7. Volcanoes destroy houses and people and crops when they erupt

PELE-
THE VOLCANO GODDESS (story title)

MYTH (key concept)

*1. EXPLAINS HOW THINGS HAPPEN in nature

*2. HAVE GODS AND GODDESSES THAT ARE HEROES

*3. THERE IS EVIL AND GOOD

4. Myths are not true, they're fiction

5. Myths can come from any country

*Represents confirmation of prior knowledge

CAPITAL LETTERS REPRESENT STUDENTS' PRIOR KNOWLEDGE OF THE KEY CONCEPTS and the lower case letters represent students' post knowlege of the same key concepts

within the story remained on the map. Misinformation was clarified and/or removed from the map. Finally, new information gained from the story was added to the map. (Note: New information is illustrated on the sample map with lower case typing; however, in the actual classroom situation different colors of marking pens were used to differentiate between pre and post mapping information.)

DAY 3 SUMMARY WRITING. Students wrote a short summary of the story in a writing notebook provided for them.

DAY 4 COMPREHENSION TEST. The students responded to a ten-item test developed by the researchers to assess comprehension of the story.

Portions of Day 3 and all of Day 5 were devoted to other language arts skills such as spelling and handwriting that were taught by the classroom teacher within the language arts block of time. Each daily language arts block was ninety minutes in length.

The control group read the same six stories and followed a similar schedule. With this group, the teacher followed the sequence of activities outlined in the basal reader. The control group schedule was as follows:

DAY 1 Introduce story and vocabulary words. Silent reading of story.

DAY 2 Oral discussion of story using questions from basal reader to check comprehension.

DAY 3 Summary Writing.

DAY 4 Comprehension Test. The control group was given the same 10-item test based on the content of the story.

No direct instruction in summary writing was given to either treatment or control groups. Instructional time devoted to reading was held constant for both groups.

Dependent Measures

The six ten-item tests developed for the respective stories were summed over to yield one overall measure of comprehension for both groups. In order to achieve a balance of item types, each measure was designed to include four items at the literal/factual level, three at the inference/interpretive level, and three at the evaluative level. The literal/factual questions generally were multiple-choice in format or short, objectively scored items. These items included such things as drawing meanings of words or asking for details stated directly in the story. The inference/interpretive questions required the examinee to predict outcomes, read between the lines or arrive at generalizations. These items were generally open-ended, requiring the student to construct a response. The evaluative questions called for logical and reasoned judgements on the part of the student. These questions, too, were open-ended. A graduate research assistant scored all questions "blindly" in that she did not know to which group the individual Ss had been assigned. A scoring guide was provided for the open-ended questions. When an answer did not fit possible answers on the scoring guide, one of the researchers arbitrated, again without knowing the identity of the S. For some answers, half credit was allowed.

A holistic scoring procedure was used to evaluate the overall merit of the final written summary. Two readers were trained to score essays using a four-point scale. Two independent readings were given to each summary. Educational Testing Services scoring procedures (ETS, 1979) were used. Scores that differed more than one point were arbitrated by a third reader.

RESULTS

Separate t-tests for independent samples were used to compare performances of the treatment and control groups on the reading comprehension measure and the written summaries. The means, standard deviations, and t-value for treatment and control groups on the 60-item reading comprehension measure are shown in Table 1. The group receiving the composing model scored significantly higher than the group receiving the traditional basal reader approach ($t = 4.16$; $df = 28$; $p < .01$).

The means, standard deviations, and t-value for the two groups on written summaries are shown in Table 2. No significant difference was found between the treatment and control groups ($t = .52$, $df = 28$).

Table 1. Means, Standard Deviations, and t-value for Treatment and Control Groups on 60-item Reading Comprehension Measure

Group	N	$\bar{X}$	SD	t
Treatment	15	52.07		4.16**
Control	15	46.33		

df = 28
* p < .05
** p < .01

Table 2. Means, Standard Deviations, and t-value for Treatment and Control Groups on Written Summaries

Group	N	$\bar{X}$	SD	t
Treatment	15	4.46	1.54	.52 NS
Control	15	4.73	1.24	

df = 28
(Based on 1-4 holistic scale, summed over two readers.)

DISCUSSION

The results presented are consistent with the hypothesis that a composing model for teaching a basal reader story would enhance reading comprehension. The scores of treatment group were markedly higher than the control group on the 60-item measure of reading comprehension. Visual representation of the key concepts prior to reading the story, oral sharing of ideas, and the confirmation and addition of concepts after reading the story appear to work effectively with students at this grade level. Additionally, students and teachers interviewed showed interest and enthusiasm for this technique.

Since no difference in the overall quality of writing between the two groups was found, it appears that the model did not affect writing performance in the mode assessed. The means were low for treatment and control groups (4.46 and 4.73, respectively) indicating a need for direct instruction for both groups. Further, a more appropriate mode of writing, allowing students to elaborate and include rich details, would complement the mapping strategy better. Measures of elaboration such as increased subordination, density of thought units, or variety and richness of detail incorporated would be a better choice for a dependent measure. In retrospect, the reading treatment appears to foster more elaborate thinking while the writing activity required of students in the study was more reductive in nature, requiring students to abstract and summarize. Further, since abstracting is a difficult skill for this age learner, it would be useful to provide direct instruction in this type of writing.

In using the information gained from the pilot to design a more extensive study the following changes were made. The mapping model is currently being used in eight classrooms with four teachers. Journal

writing is being used with the key concept mapping. Measures of elaboration, cohesion, and overall quality of writing will be used. Reading comprehension is again being assessed in a similar manner. Analysis of results by item type is also planned. Hopefully, findings from the present study will support and extend our findings in the pilot study.

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